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Fax Transmission

To: Steve Sexton +
Jim Meeller
Company: HPS
Fax #:

Date: 3/10/99

From: Matt Taylor, ext. 222

No. pages: 4
(Including cover sheet)

Message:

Here is the marked-up cable
drawing + the time line from
Luke to Kelly + Fred

Thank a million for picking this
up so late + bringing us up to speed
so quickly!!!!

A handwritten signature, likely of Matt Taylor, consisting of stylized, overlapping letters.

FAX

DATE: DECEMBER 16, 1998

TO: MKS-SANTA CLARA

ATTN: MATT TAYLOR

FROM: DICK JACOBS

REF: LOADLOCK TRANSDUCER

=====

HERE IS THE INFORMATION YOU REQUESTED FROM LUKE.

REGARDS, DICK

CPD Work Breakdown Structure														
ID	Task Name	Dur	Start	Finish	1Q99			2Q99			3Q99			
					Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1	1.0 CONCEPT PHASE	19 days	Mon 11/2/98	Mon 11/30/98										
2	1.1 Complete New Product Concept Identification Form (NPCIF)	3 days	Mon 11/16/98	Wed 11/18/98										
3	1.2 CONCEPT IDENTIFICATION COMPLETED	0 days	Wed 11/18/98	Wed 11/18/98										
4	1.3 Gather Business-Product Description - Risk & Resource Requirement Info	3 wks	Mon 11/2/98	Fri 11/20/98										
5	1.4 Prepare Definition Proposal Document	3 days	Mon 11/23/98	Wed 11/25/98										
6	1.5 DEFINITION PROPOSAL REVIEW	1 day	Mon 11/30/98	Mon 11/30/98										
7	1.6 Concept Approved	0 days	Mon 11/30/98	Mon 11/30/98										
8	2.0 DEFINITION PHASE	67 days	Thu 11/5/98	Wed 2/17/99										
9	2.1 Establish Design Record Book	3 days	Tue 12/1/98	Thu 12/3/98										
10	2.2 Gather Customer Requirements	6 wks	Thu 11/5/98	Fri 12/18/98										
11	2.3 Customer Requirements Completed	0 days	Fri 12/18/98	Fri 12/18/98										

Project: Loadlock Gauge Developme Date: 11/23/98 Filr: sch9811a.mpp	Task	Summary	Rolled Up Progress
	Split	Rolled Up Task	External Tasks
	Progress	Rolled Up Split	Project Summary
	Milestone	Rolled Up Milestone	

CPD Work Breakdown Structure									
		1Q99		2Q99		3Q99			
		Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
ID	Task Name	Dur		Start	Finish				
12	2.4 Generate External Specifications Document	3 days		Mon 12/21/98	Wed 12/23/98				
13	2.6 Generate Internal Specifications Document	3 days		Mon 2/8/99	Wed 2/10/99				
14	2.7 Initial Specification Completed	0 days		Wed 2/10/99	Wed 2/10/99				
15	2.20 Generate the Product Development Schedule	2 days		Thu 2/11/99	Fri 2/12/99				
16	2.21 Complete the Development Proposal document	2 days		Mon 2/15/99	Tue 2/16/99				
17	2.22 DEVELOPMENT PROPOSAL REVIEW	1 day		Wed 2/17/99	Wed 2/17/99				
18	2.23 PRODUCT APPROVED	0 days		Wed 2/17/99	Wed 2/17/99				
19	3.0 Development Phase	96 days		Thu 4/28/99	Thu 6/10/99				
20	3.2 Generate the Final Specification	2 days		Thu 2/18/99	Fri 2/19/99				
21	3.3 Initiate D.C.R. to release the Final Specification	1 day		Mon 2/22/99	Mon 2/22/99				
22	3.4 FINAL SPECIFICATION COMPLETED	0 days		Mon 2/22/99	Mon 2/22/99				
23	3.11 Build the "Breadboards"/"Brassboards" (Acquire from HPS)	3 wks		Thu 1/28/99	Wed 2/17/99				

Project Loadlock Gauge Development
Date: 11/23/98
File: sch9811a.mpp

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CPD Work Breakdown Structure

ID	Task Name	Dur	Start	Finish	1Q99			2Q99			3Q99				
					Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
24	3.12 Test the concept and/or test pieces	2 wks	Thu 2/18/99	Wed 3/3/99											
25	3.13 Document the concept test results	2 days	Thu 3/4/99	Fri 3/5/99											
26	3.14/3.15 DESIGN REVIEW	1 day	Mon 3/8/99	Mon 3/8/99											
27	3.17 Design the PC Boards (using CAD tools)	4 wks	Tue 3/9/99	Mon 4/5/99											
28	3.18 Design the Mechanicals (using CAD tools)	4 wks	Tue 3/9/99	Mon 4/5/99											
29	3.20 Design the Packaging (using CAD tools)	2 wks	Tue 3/23/99	Mon 4/5/99											
30	3.21 Create the Prototype Test Plan	3 days	Tue 3/9/99	Thu 3/11/99											
31	3.24 Perform FMEA analysis	1 wk	Tue 4/6/99	Mon 4/12/99											
32	3.25 Generate FMEA report	2 days	Tue 4/13/99	Wed 4/14/99											
33	3.26 Build and Test the Prototypes	5 wks	Tue 4/6/99	Mon 5/10/99											
34	3.28 Document the Prototype Test Results	3 days	Tue 5/11/99	Thu 5/13/99											
35	3.29 CRITICAL FUNCTION VERIFIED, PROTOTYPE BUILT AND TESTED	0 days	Thu 5/13/99	Thu 5/13/99											

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CPD Work Breakdown Structure

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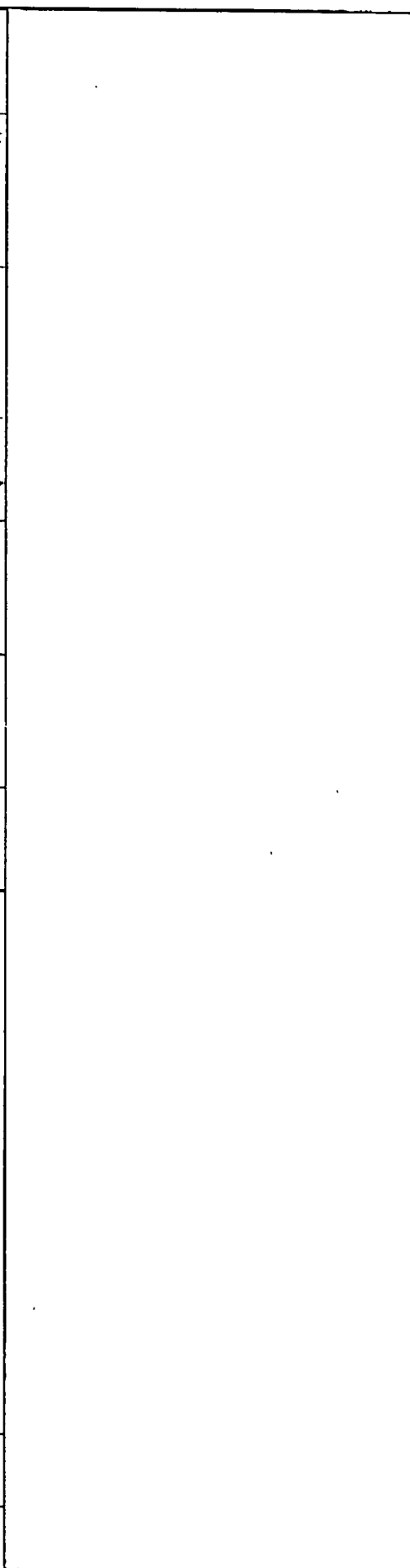
Task	Summary	Rolled Up Task	Rolled Up Progress
Split			External Tasks
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CPD Work Breakdown Structure

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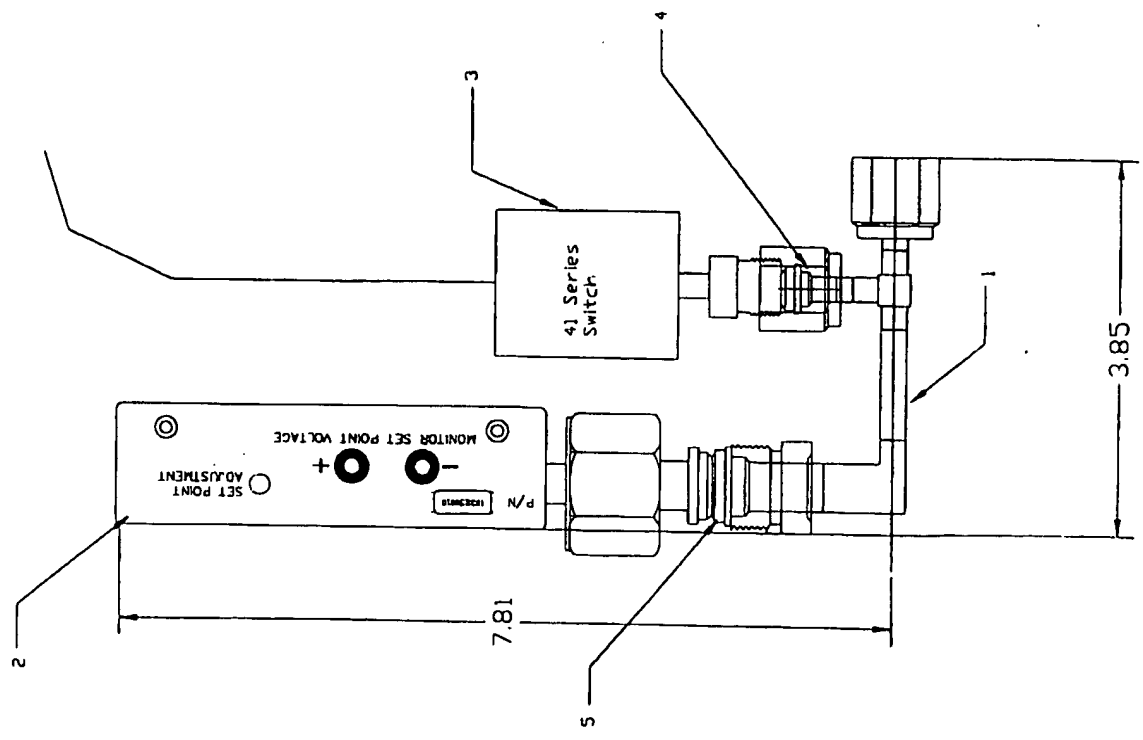
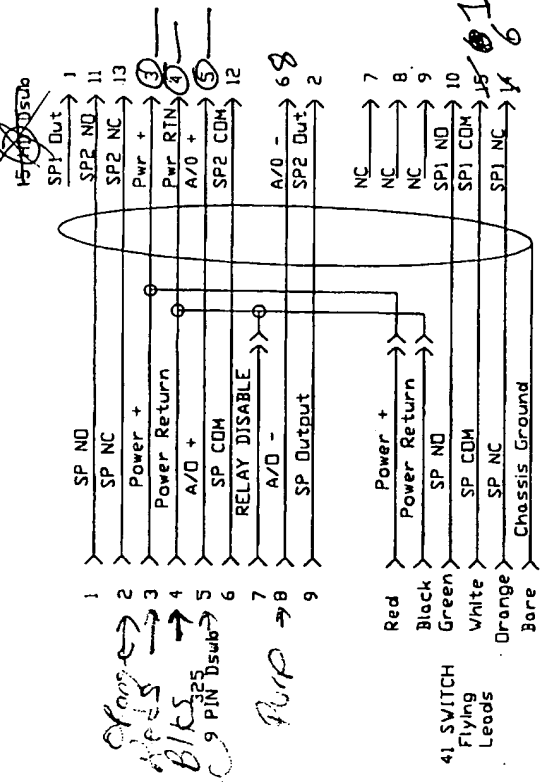
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60	4.10 MANUFACTURING BETA REVIEW	1 day	Tue 6/22/99	Tue 6/22/99																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													



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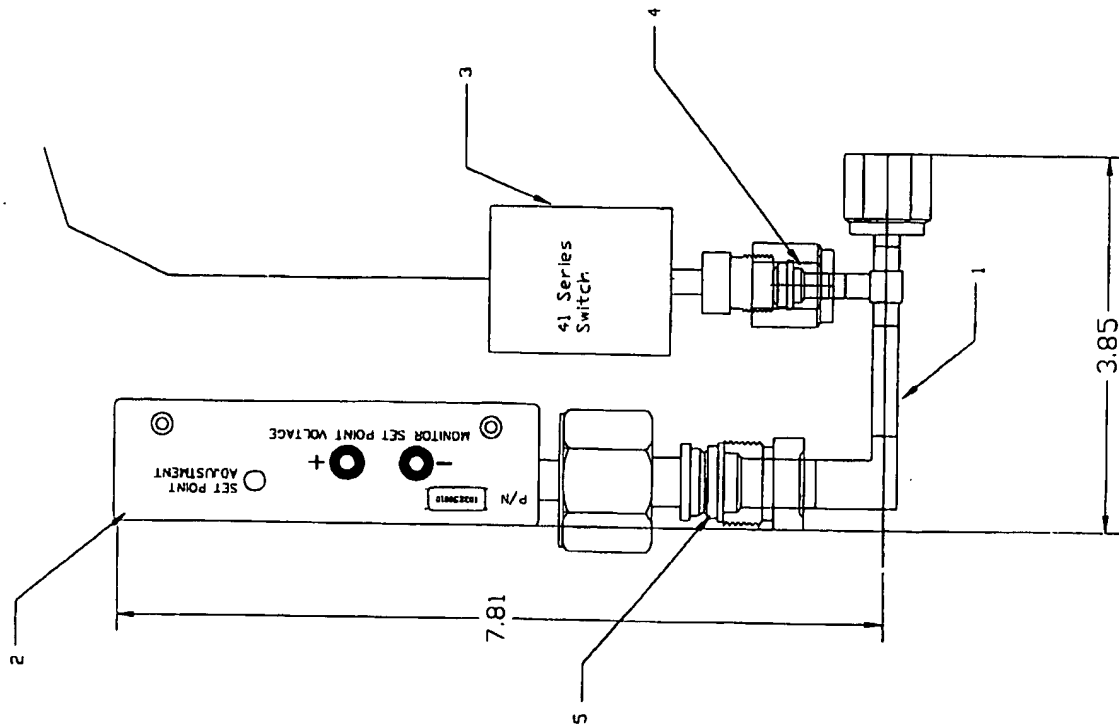
5	1	EA	GASKET, CU, BVCR	ITEM QTY U/M DESCRIPTION The information furnished on this drawing was obtained from the inventory of the Division of West Instruments, Inc. and represents the current information available in the Division's inventory. The information may not be current in the field. The user is advised that the information may not be current in the field. The user is advised that the information may not be current in the field. The user is advised that the information may not be current in the field.	9/2/98	SCALE 1=1	MS 100005876
4	1	EA	GASKET, CU, 4VCR		STAFFORD	STAFFORD NA	MS 100006438
3	1	EA	ATM SWITCH, 41A, 110CA18F003		STAFFORD	STAFFORD NA	PUR 41A110CA18F003
2	1	EA	325.15V, BVCR, SHORT		STAFFORD	STAFFORD NA	DWG 100250012
1	1	EA	MAN, PIRANI/ATM SWITCH		STAFFORD	STAFFORD NA	DWG 93-7585A
				ASSY, PIRANI/ATM SWITCH			
				SHEET 1 OF 1			DWG 93-7585A
				HPS Division			
				WEST INSTRUMENTS, INC.			

TOLERANCES
UNLESS OTHERWISE SPECIFIED:
FRACTIONS - .005 INCH
DECIMALS - .001 INCH
HOLE - .002 INCH
SHAFT - .001 INCH
SURFACES - V

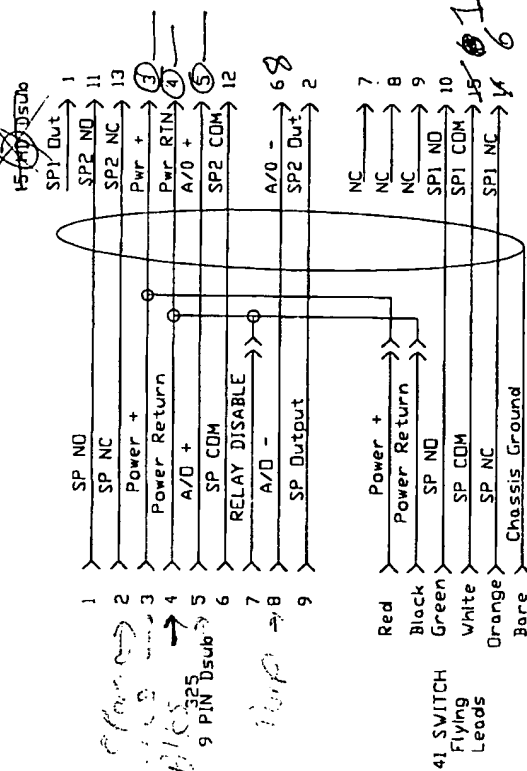
HPS
Division
MANUFACTURING INC.

ASSY, PIRANI/ATM SWITCH

ECO	REV	DESCRIPTION	DATE
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Apple
Inc.



5	1	EA	GASKET,CU,BVCR	MS	100005876
4	1	EA	GASKET,CU,4VER	MS	100006438
3	1	EA	ATM SWITCH 41A,10CA1BF003	PUR	41A10CA1BF003
2	1	EA	325,15V,BVCR,SHORT	DWG	103250012
1	1	EA	HAM,PIRANI/ATM SWITCH	BVG	93-7585A
ITEM		QTY	U/M	DESCRIPTION	
<p>THE INFORMATION CONTAINED ON THIS DRAWING IS HEREBY CERTIFIED THAT IT IS THE PROPERTY OF HPS. DRAWING IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT PERMISSION IN WRITING. REQUESTED BY THE BUREAU OF RESEARCH, ARMY, 3400 PARKWAY, ST. LOUIS, MO 63166, USA.</p>					
TOLERANCES		<p>UNLESS OTHERWISE SPECIFIED</p> <p>0.125" = 0.1" MICH</p> <p>0.063" = 0.05" MICH</p> <p>0.031" = 0.02" MICH</p> <p>ANGLES = 90°</p> <p>FINISH = 32</p> <p>W/ALL CORNERS</p> <p>0.015" RICH MAX</p> <p>SAFETY A</p>			
HPS		<p>ASSY,PIRANI/ATM SWITCH</p>			
Division		<p>ENGINEERING</p>			
SHEET 1 OF 1		<p>93 7585 A</p>			

MASTER V vs P TABLE FOR HPS 325 SENSOR WITH NITROGEN

p, torr	V, Volts	p, torr	V, Volts	p, torr	V, Volts	p, torr	V, Volts	p, torr	V, Volts	p, torr	V, Volts
0.0010	0.22094	0.010	0.32604	0.10	0.80173	1.0	1.9935	10	2.9967	100	3.1931
0.0012	0.22385	0.012	0.34488	0.12	0.86840	1.2	2.1043	12	3.0328	120	3.1970
0.0014	0.22672	0.014	0.36269	0.14	0.92892	1.4	2.1961	14	3.0587	140	3.1999
0.0016	0.22955	0.016	0.37961	0.16	0.98448	1.6	2.2735	16	3.0780	160	3.2022
0.0018	0.23234	0.018	0.39576	0.18	1.03592	1.8	2.3399	18	3.0931	180	3.2040
0.0020	0.23509	0.020	0.41124	0.20	1.08386	2.0	2.3975	20	3.1052	200	3.2055
0.0025	0.24184	0.025	0.44741	0.25	1.19134	2.5	2.5130	25	3.1270	250	3.2084
0.0030	0.24839	0.030	0.48065	0.30	1.28496	3.0	2.6002	30	3.1415	300	3.2106
0.0035	0.25477	0.035	0.51153	0.35	1.36793	3.5	2.6684	35	3.1519	350	3.2124
0.0040	0.26098	0.040	0.54046	0.40	1.44240	4.0	2.7233	40	3.1597	400	3.2139
0.0045	0.26704	0.045	0.56775	0.45	1.50989	4.5	2.7685	45	3.1658	450	3.2152
0.0050	0.27296	0.050	0.59362	0.50	1.57153	5.0	2.8064	50	3.1707	500	3.2165
0.0055	0.27875	0.055	0.61825	0.55	1.62818	5.5	2.8386	55	3.1747	550	3.2176
0.0060	0.28441	0.060	0.64179	0.60	1.68052	6.0	2.8663	60	3.1781	600	3.2187
0.0065	0.28996	0.065	0.66437	0.65	1.72910	6.5	2.8903	65	3.1809	650	3.2197
0.0070	0.29540	0.070	0.68606	0.70	1.77436	7.0	2.9115	70	3.1834	700	3.2207
0.0075	0.30074	0.075	0.70696	0.75	1.81668	7.5	2.9302	75	3.1855	750	3.2217
0.0080	0.30597	0.080	0.72715	0.80	1.85636	8.0	2.9469	80	3.1874	800	3.2226
0.0085	0.31112	0.085	0.74666	0.85	1.89368	8.5	2.9619	85	3.1891	850	3.2235
0.0090	0.31618	0.090	0.76557	0.90	1.92885	9.0	2.9754	90	3.1906	900	3.2244
0.0095	0.32115	0.095	0.78391	0.95	1.96207	9.5	2.9876	95	3.1919	950	3.2253
0.0100	0.32604	0.100	0.80173	1.00	1.99352	10.0	2.9988	100	3.1931	1000	3.2261

X 3

for all values!

Hal Fortna 01/21/99 10:11 AM

To: Dick Jacobs/US/MKS@MKSINST
cc: Jack Gillespie/US/MKS@MKSINST
Subject: 41 Switch Hysteresis Resistor

Dick,

8ea.

I've determined that using MKS part number 065-0614 (124kohm) will give a hysteresis close to 10% for the 41 switch. This resistor replaces part number 065-0614 at location R17 on the circuit board. There are 751 of these in the stock room downstairs. This value will not give precisely a 10% hysteresis since there is a nonlinear relationship between the resistor value and actually flipping the relay. However, this should put us fairly close and if we need to fine tune it we can. Any data Santa Clara can gather will make the process quicker (i.e. output voltage when relay trips).

This is the basic information required to make the change. Do we need to provide a drawing to support this message?

Hal

ATT: Matt Taylor

Will have Cheryl Fed Ex PI you

8 resistors. Is this enough for now?

Dick

